

IV. *On the Metamorphoses of two Hemiptera-Heteroptera from Southern China.* By J. C. W. KERSHAW, F.E.S., and G. W. KIRKALDY, F.E.S.

[Read February 5th, 1908.]

PLATES IV, V.

IN the Transactions of this Society for 1907 (Part II) the metamorphoses of *Tessaratoma papillosa* were described by Kershaw and Muir. A similar paper by Kershaw and Kirkaldy on those of *Dindymus sanguineus* and *Cænocoris marginatus* will appear in the Journal of the Bombay Natural History Society, and the same authors now offer notes on the metamorphoses of *Chrysocoris stollii* and *Riptortus linearis*.

Chrysocoris stollii (Wolff).

This species has, so far as we are aware, been figured previously in the adult state only by Wolff (with his original description) and by Westwood (as *Callidea stocckerus*, in his edition of Donovan's "Insects of China," Pl. 21, fig. 1 [1842]). It is distributed rather widely, from India to South China *via* Burma. It is also recorded from the Nicobars, Formosa and North China.

The female lays a batch of about a dozen eggs on leaves of many plants, among which the following seem to be the chief—

<i>Glochidion obscurum</i> , Bl.	}	N. O. <i>Euphorbiaceæ</i> .
<i>G. eriocarpum</i> , Champion		
<i>G. macrophyllum</i> , Benth.		
<i>Psychotria elliptica</i> , Ker.,		N. O. <i>Rubiaceæ</i> .

The nymphs and adults feed on the fruit of these plants; the newly-hatched nymphs would also accept *Lantana* berries and banana, though these are probably not their natural food.

Some females in captivity laid batches of eggs at intervals, but without the red markings (presently to be described), and none of these eggs hatched; there was no male with these females. Similar eggs, however (which

never hatched), were laid by a female after copulation. This failure was certainly not due to mites or mould, as the eggs remained firm and of fresh colour for several weeks. It is probable that the females copulate after each batch of eggs is laid.

The eggs are laid touching one another, and are pale hyaline-green, almost globular. A darkish-red marking like a small nail (thus I), and below this a curved red marking (thus ω), the two resembling an anchor. There is no peculiar cap to the egg, the hinge being merely indicated by a ring of minute protuberances like a string of pearls (Pl. IV, figs. 1 and 1a).

On the morning of August 28th, 1907, eleven ova were laid, and on the morning of the 30th a black mark showed on the centre of the curved red marking, the latter becoming slightly altered. The next morning the general colouring was yellowish, or pale pinkish-yellow, the red markings as before. The nymphs hatched the same afternoon, less than four days, remaining for several hours in a cluster on one side of the empty shells, eating nothing till after the first moult.

This first instar is shining black, with yellowish-white markings (Pl. IV, fig. 2).

The first moult took place on the afternoon of September 3rd, the metallic colouring then first appearing (fig. 3).* The nymphs then separated to feed, re-forming in a semicircular cluster at night. These young nymphs stand up very high on their legs.

The second moult took place on the 12th (fig. 4), and the third on the 21st September, and soon after the few remaining ones died. Fig. 5 represents the penultimate (?) nymphal instar of a closely allied species, while fig. 6 shows the final nymph of *C. stollii*, the adult being shown at figs. 7 and 8.†

The adults have a strong, disagreeable smell. They fly well, but rather heavily, and are common in wooded places and jungle during the wet season, though they are to be found throughout the year. During the dry season on very cold days they hide away under leaves, etc., often creeping between leaves which a spider has fastened together.

* They are pale red for a few minutes after the moult.

† The pronotum is a little foreshortened in fig. 7, the lateral margins of the pronotum being straighter.

Riptortus linearis (Linné).

This species is widely distributed from India to China via Burma, and from Ceylon through the Indo-Malayan Archipelago. It has been figured only in Herrich-Schäffer's "Wanzenartigen Insekten" (vol. viii, fig. 867), a rare work.

Riptortus linearis is apparently entirely vegetarian, feeding on the seed-pods of various *Leguminosæ*, etc., principally *Cassia occidentalis*, Linné, *Desmodium pulchellum*, Benth., and *Pueraria phasecoloides*, Benth.

The ova are deposited irregularly on the stems and leaves, and are cauldron-shaped, dark bronzy-brown, sometimes slightly dusted with a whitish waxy substance (like that on most Hesperid pupæ). There is no special cap. On September 30th, 1907, eleven ova were laid (Pl. V, fig. 1), which hatched on October 6th. The newly-hatched nymphs are shiny reddish-yellow-brown; legs and antennæ semi-transparent, pale yellow-brown, and are very like small red ants (fig. 6). The first moult occurred on October 8th, with very little change, but the nymphs are now larger and darker.

The second moult took place on the 13th, and the nymphs are now very dark, but with little change except in size and colour (figs. 2 and 3).

The third moult was on the 18th, the general hue being dark grey-brown, the tegminal pads quite large, but not noticeable unless examined closely (fig. 4). The adults hatched out on October 23rd (fig. 5).

For some minutes after each moult the entire bug is pinkish or pale red. In each instar the first segment of the tarsi and the antennal articulations are pale. The dorsal odoriferous flaps are very conspicuous in the nymphs.

The last moult is soon accomplished, the adult (as it rids itself of the nymphal skin) being pale yellowish-pink, the wing veins darker pink. The apices of the tegmina are at first slightly crumpled and rather shorter than the apex of the abdomen, but are smooth and flush within fifteen minutes. Within an hour of the ecdysis the natural colouring is complete, chiefly bronzy-brown. The bug apparently sometimes has an extra nymphal instar.

Throughout the nymphal instars the bug is exceedingly like an ant, the later ones closely resembling one of the

commonest Chinese ants, a large black-and-grey species. It is not believed, however, that there is any "protective resemblance" in this association. The nymphs are very active, and stand high on their legs, while the adults spread out the hind-legs very flat, so that the body is near the surface on which the bug rests.

The adults give off a strong smell when irritated. They fly well, and are very common on low herbage and rank vegetation, while from the amount of liquid excrement they pass, they must injure very much the plants on which they feed. They are common throughout the wet season, especially August and September.

EXPLANATION OF PLATES IV, V.

[See *Explanation facing the PLATES.*]